Mitigating Volatile Organic Insecticides in Grapes, Almonds and Walnuts

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Smart Sprayer Technology

Grape VOC Insecticides

- Chlorpyrifos (Lorsban)
- Fenpropathrin (Danitol)
- Avermectin (Agrimek)
- Dimethoate (Cygon)
- Naled (Dibrom)
- Potassium fatty acid soap (M-Pede)

Key Grape Pests Managed Critical Insecticides

- **Lorsban**
  - vine mealybug, grape mealybug, black widow spider
- **Danitol**
  - Black widow spider and some use on various worm species
- **Agrimek**
  - Pacific mite and Willamette mite (Omite replacement/worker safety and Industry demands)
- **Dimethoate**
  - Not regularly used
- **Dibrom**
  - No longer needed
- **Potassium fatty acid soap (M-Pede)**
  - Powdery mildew, mites, leafhoppers

Almond VOC Insecticides

- Chlorpyrifos (Lorsban)
- Permethrin (Pounce/Ambush)
- Avermectin (Agrimek)
- Propargite (Omite)
- Methidathion (Supracide)
- Diazinon (Diazinon)

Key Almond Pests Managed Critical Insecticides

- **Lorsban**
  - Ants, peach twig borer, and navel orangeworm, leaffooted plant bug
- **Pounce/Ambush**
  - Peach twig borer and navel orangeworm, leaffooted plant bug
- **Agrimek**
  - Pacific mite (Omite replacement/worker safety and Industry demands)
- **Omite**
  - Pacific mite but there is a wettable powder formulation
- **Supracide?**
  - Peach twig borer and leafrollers (note use period)
- **Diazinon**
  - Peach twig borer and leafrollers (ant control)

Walnut VOC Insecticides

- Chlorpyrifos (Lorsban)
- Permethrin (Pounce/Ambush)
- Dicofol (Kelthane)
- Methidathion (Supracide)
- Diazinon (Diazinon)

Key Walnut Pests Managed Critical Insecticides

- **Lorsban**
  - Codling moth, navel orangeworm,walnut husk fly, walnut aphid, dusky vein aphid, frosted scale, walnut scale and ants
- **Pounce/Ambush**
  - Codling moth, navel orangeworm
- **Dicofol (Kelthane)**
  - Pacific mite
- **Supracide**
  - Codling moth walnut aphid, dusky vein aphid frosted scale, and walnut scale
- **Diazinon**
  - Aphid and scale insects

Approaches to Mitigation (Given Applications are Needed)

- Utilize alternative formulation
  - Efficacy and cost issues (Omite, Lorsban)
  - Is a permit required?
  - How threatening is the pest?
- Switch insecticides
  - Efficacy and cost issues (Lorsban, Admire)
  - Can commodity afford it (Table vs.. Wine)
  - Is a permit required?
- Utilize outside window of May-October
  - Lorsban in grapes, Danitol in grapes, possibly Agrimek in almonds and grapes
  - Causes more problems with surface water contamination (Diazinon/Lorsban/Supracide)

Invasive or Native

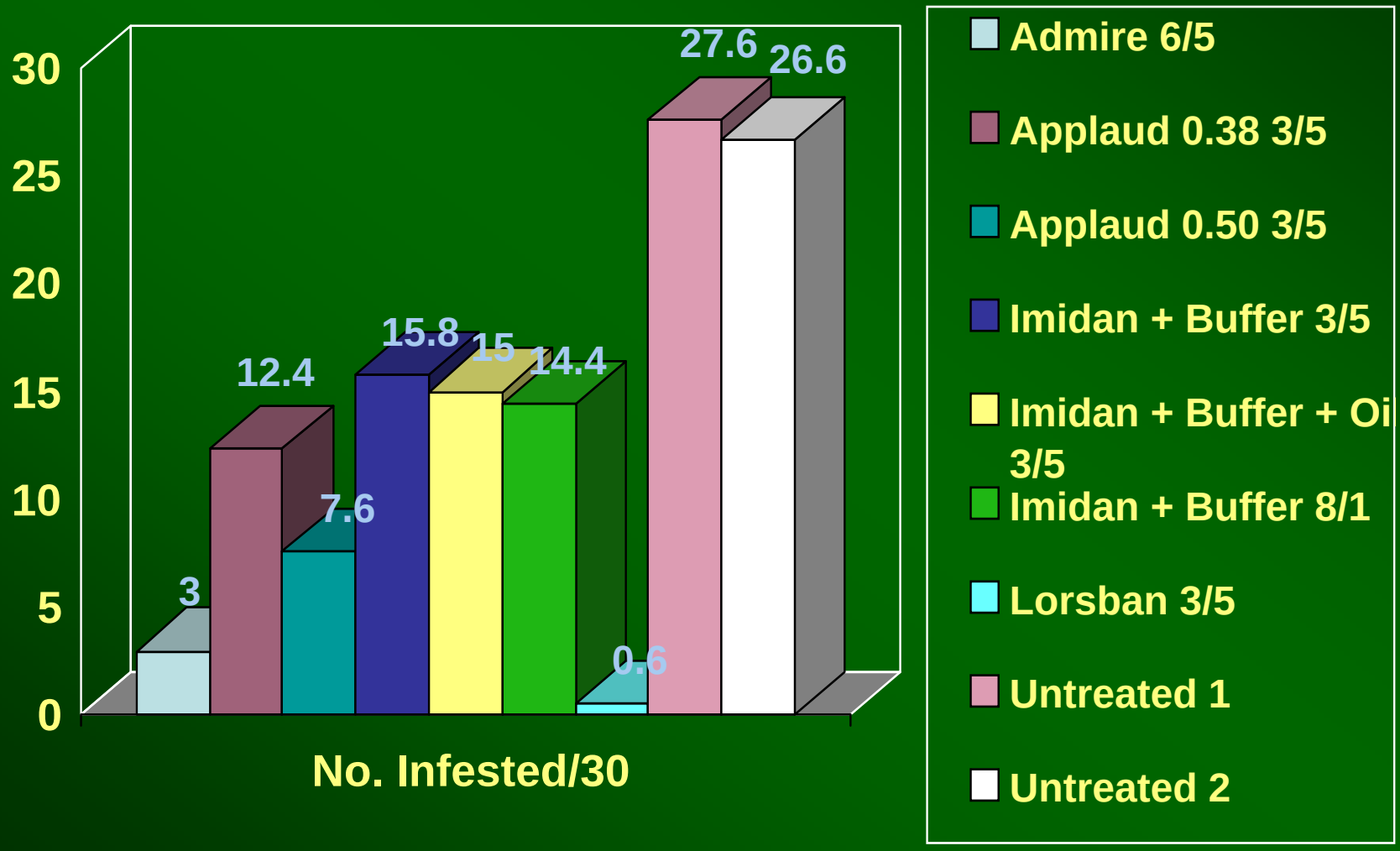
Direct Damage or Virus Transmission

Grape mealybug

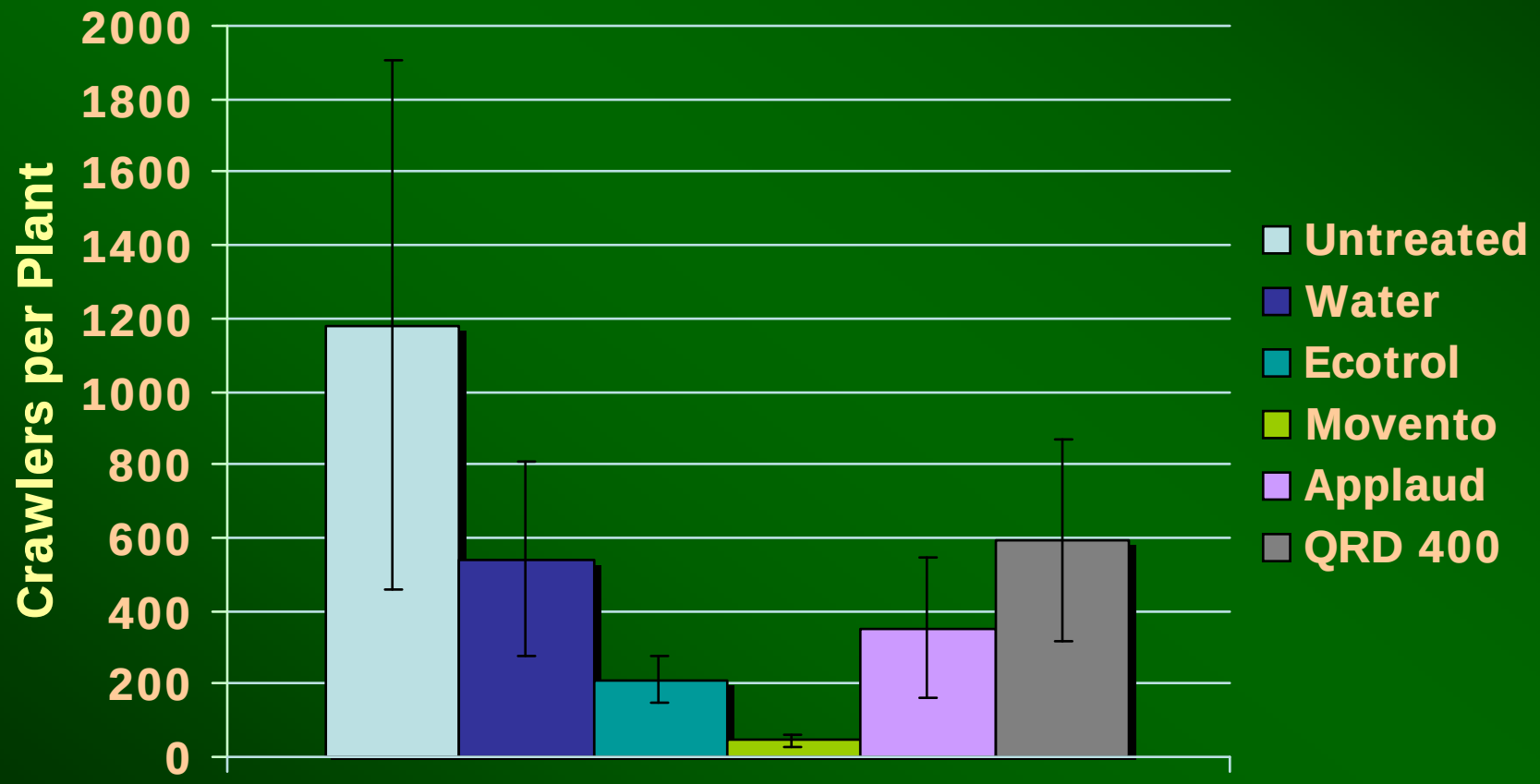
Vine mealybug

Sharpshooter

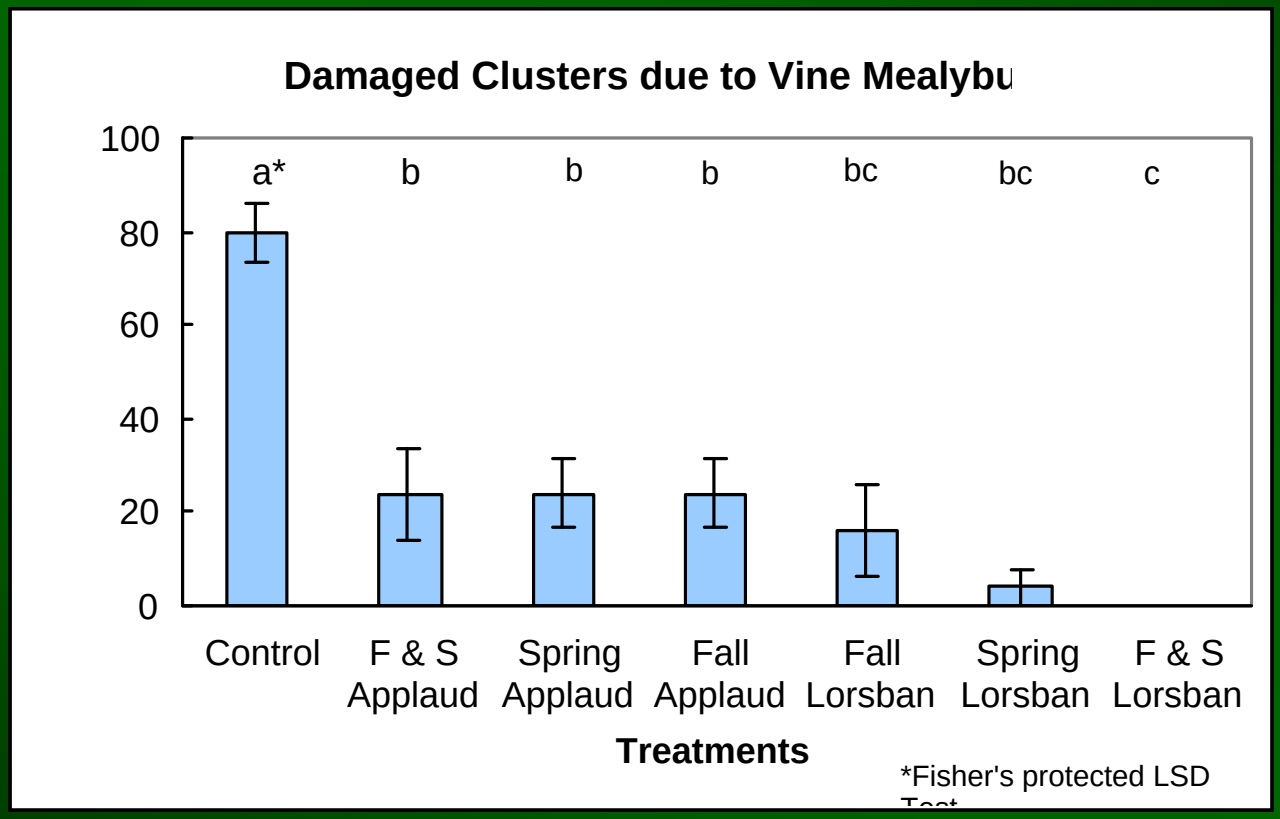
Grape Mealybug Harvest Infestation, Ruby Seedless, Mcfarland ,CA



Insecticide Efficacy, Grape Mealybug, Nursery Plant Trial



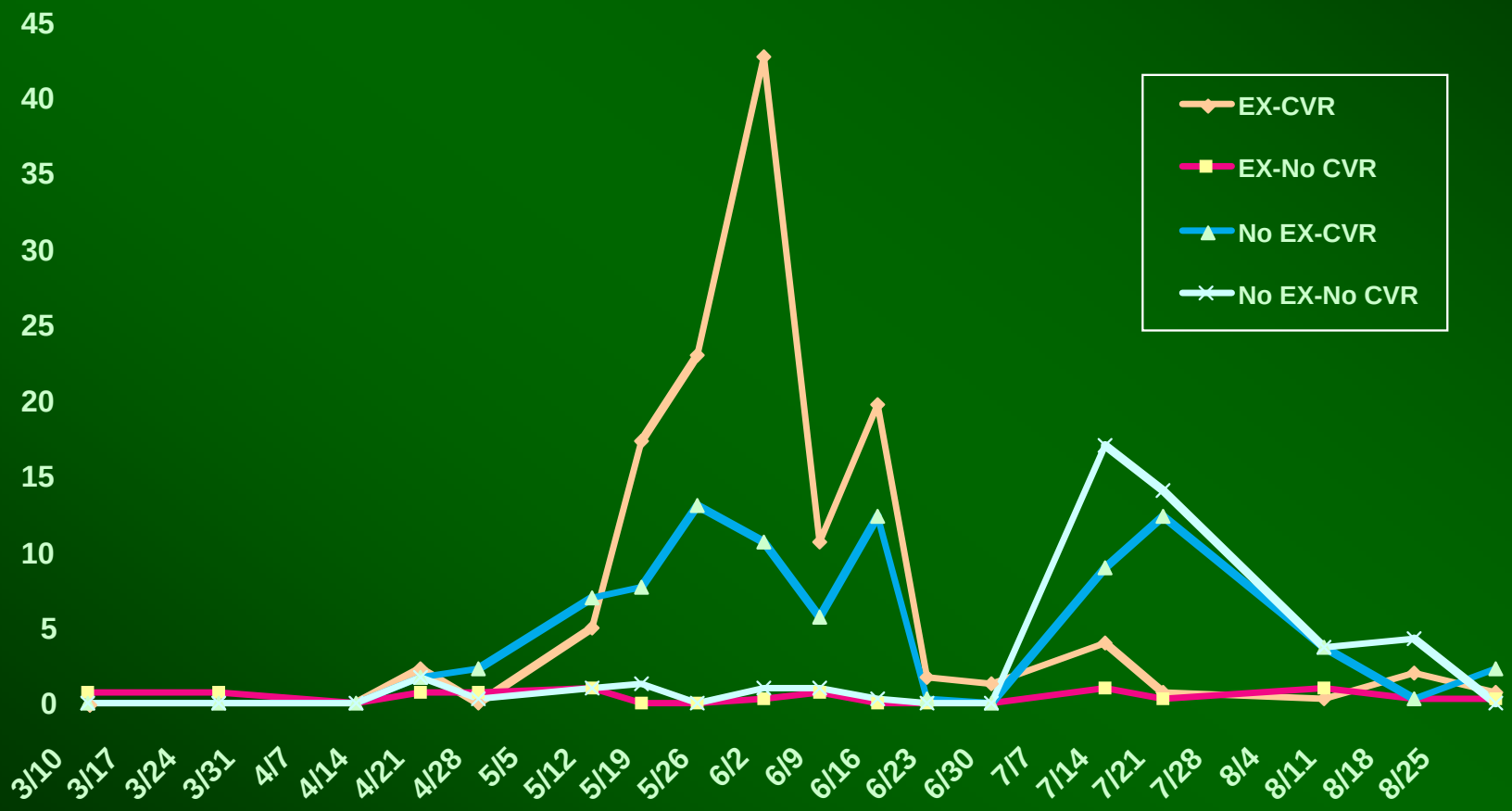
Cluster Damage from VMB



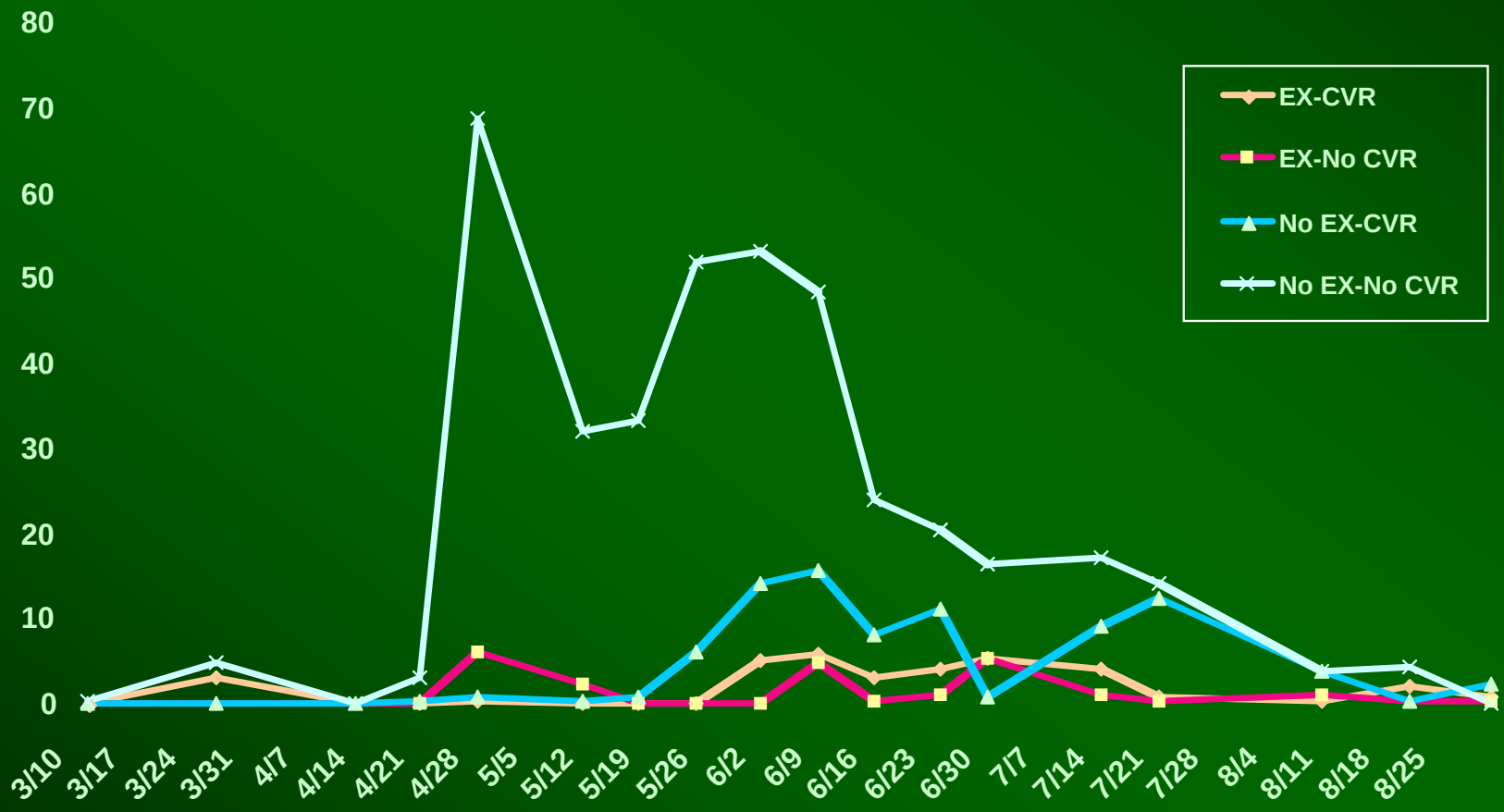
Grape mealybug parasitoids

Nectary tending

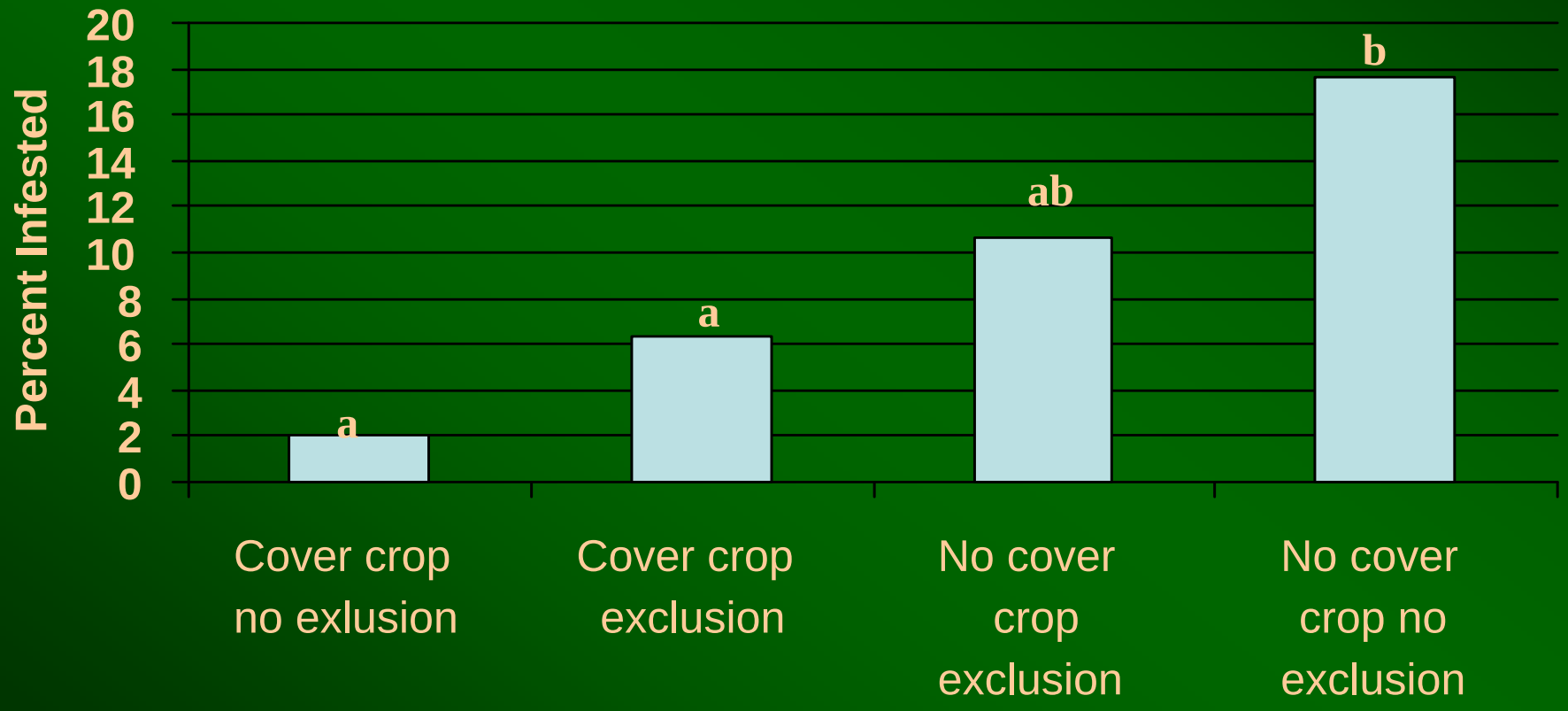
Ant counts row middle, 1999



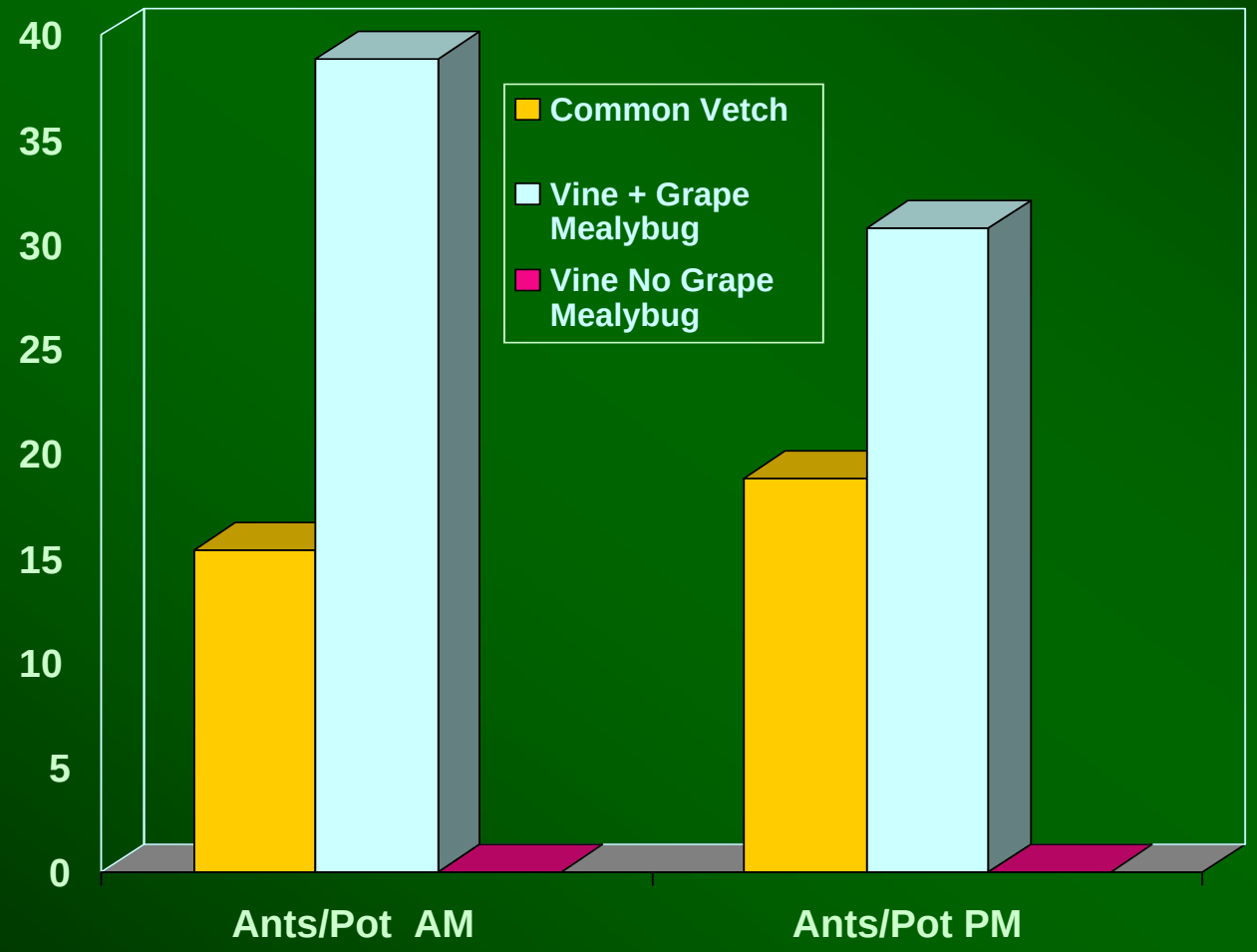
Ant counts on vine, 1999



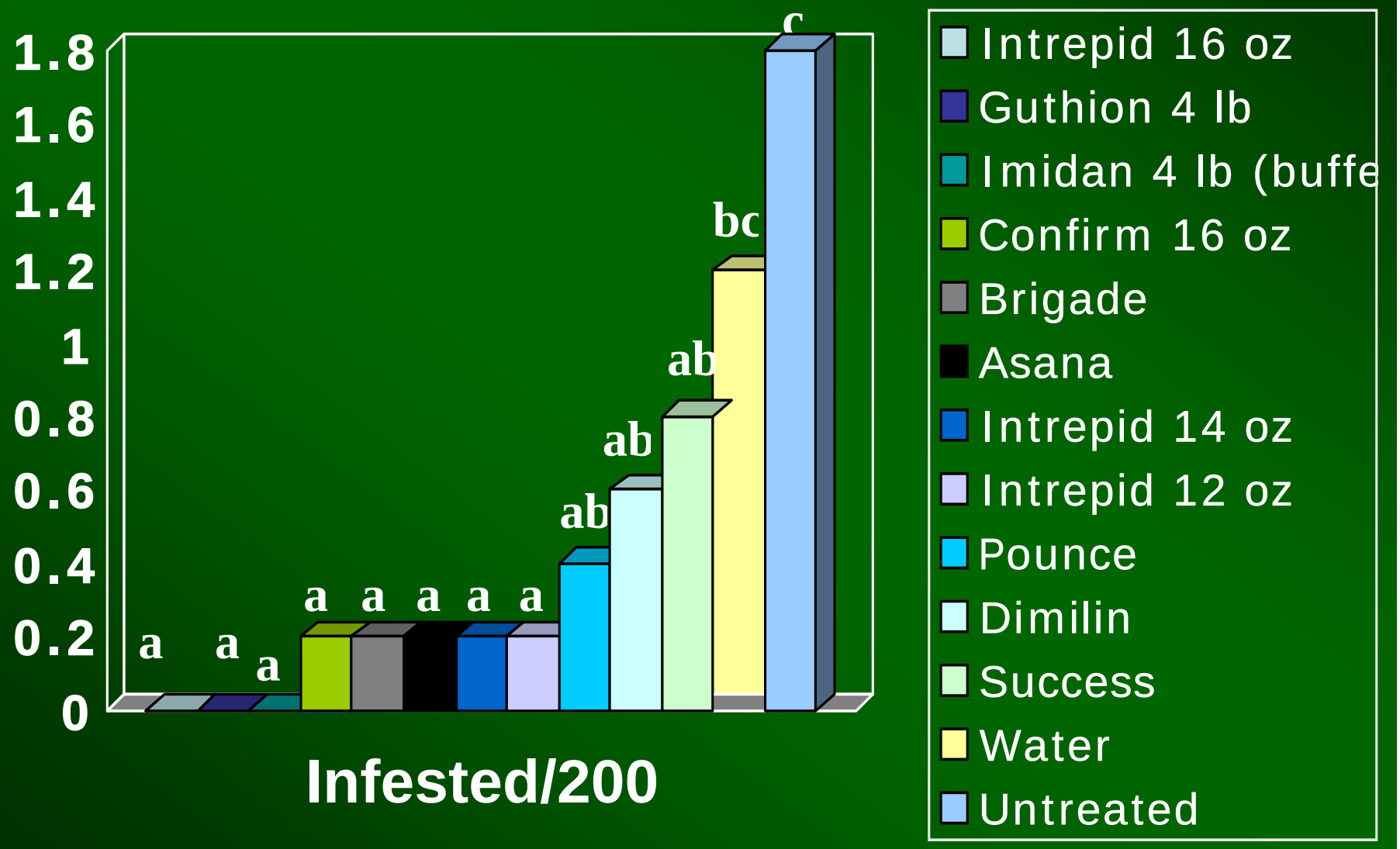
Thomson Seedless Infested Clusters, September, 1999



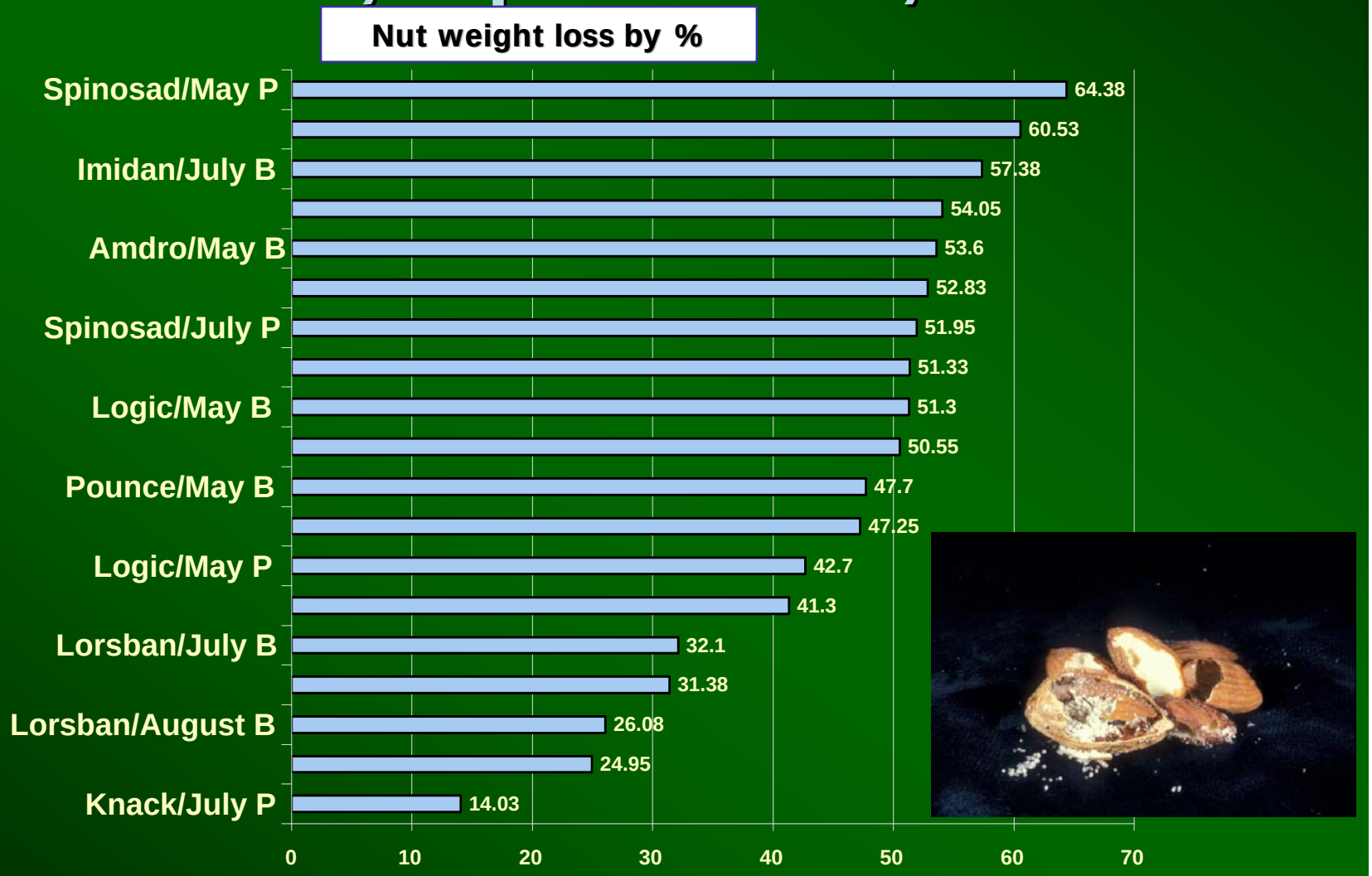
Grey field ant abundance on plants in pots



Efficacy of Various Insecticides on NOW Infestation, Pistachio



Percent Loss of Nut Weight, Southern Fire Ant, Almonds, Merced CA, September 15, 1998



Leaffooted Plant Bug Periodic Infestation Almonds

Summary

- For most insecticide pests in the commodities covered here, there are approaches to reducing VOC's
  - However, in the case of grapes and vine mealybug reduction in Lorsban will be difficult
- The cost of many non problematic insecticides will result in complaints, even when efficacious against target pests
- There will be issues with specific pest outbreaks such as Leaffooted plant bug in almonds where the use of effective products will be needed
- We will recognize very efficacious insecticides and be able to obtain better pest control with less environmental harm
- I would like to see special conditions which would allow for limited use of certain products.